Plotting Graphs of Equations in the Form y=mx+c

Starter

Fully factorise each expression:

a) $4x - 10$
b) $21a + 56$
c) $30b - 42$
d) $3x^2 + 6x$
e) $4x^3 - 6x + 12$

Starter Answers

1) $2(2x - 5)$ 2) $7(3a + 8)$ 3) $6(5b - 7)$ 4) $3x(x + 2)$ 5) $2(2x^3 - 3x + 6)$

Recap

The equation of a straight line tells you how the x and y coordinates are related.

$(x,\ y)$

x-coordinate y-coordinate

For example, the equation $y = x + 1$ means that the y-coordinate is the x-coordinate plus 1.

Example 1

Write down three coordinates of points that would be on the line $y = 2x$.

$y = 2x$ means $y = 2 \times x$
This means that the y-coordinates have to be 2 times the x-coordinates.

(1, 2), (2, 4) and (3, 6) would be on the line $y = 2x$.

Example 2

A straight line passes through (1, 3), (2, 6) and (3, 9).
What is the equation of the line?

For each point, the y-coordinate is three times the x-coordinate.
So, the equation of the line is $y = 3x$.

Example 3

Write down three coordinates of points that would be on the line $y = \frac{1}{2}x$.

This means y is half of x. (2, 1), (4, 2) and (6, 3) would be on this line.

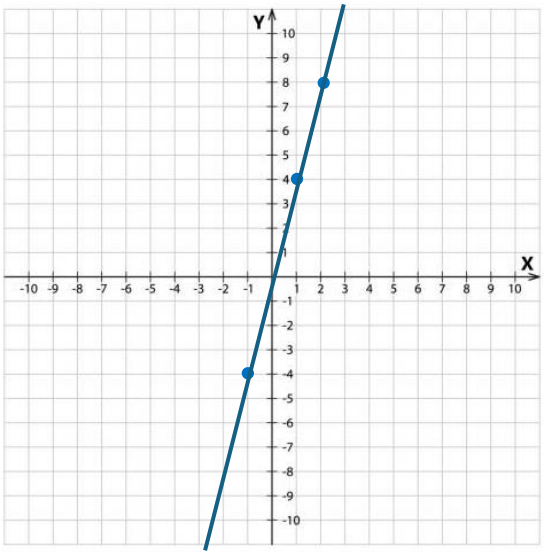
Example 4

Plot the graphs of the following equations:

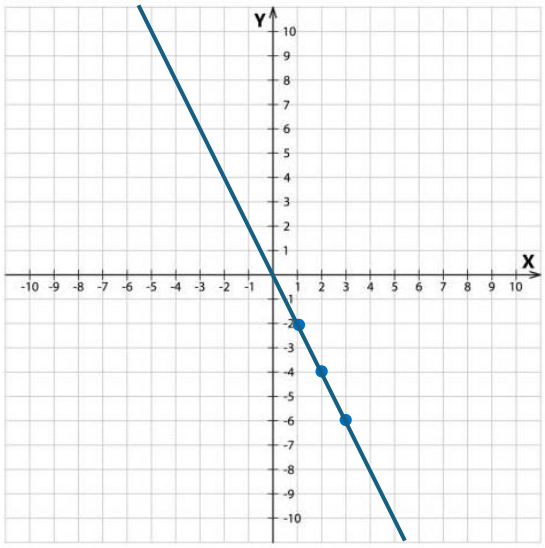
a) $y = 4x$

b) $y = -2x$

a) First find three coordinates of points on the line.
(-1, -4), (1, 4) and (2, 8) are on the line.
Now, plot these three points and join them together with a straight line.



b) $y = -2x$ means times x by -2.
(1, -2), (2, -4) and (3, -6) are on the line.



Your go

Plot the graphs:

a) $y = 5x$

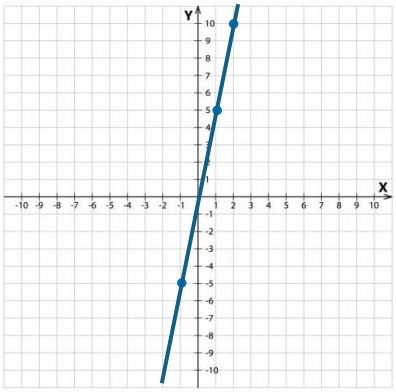
b) $y = -3x$

c) $y = \frac{1}{2}x$

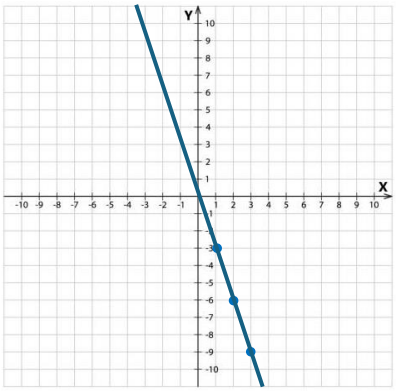
(answers on next page)

Answers

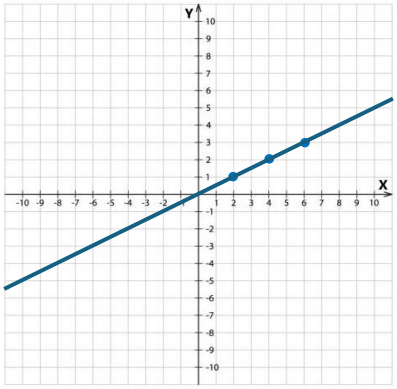
a) (1, 5), (2, 10) and (-1, -5) are on the line.



b) (1, -3), (2, -6) and (3, -9) are on the line.



c) (2, 1), (4, 2) and (6, 3) are on the line.



Example 5

Plot the graphs of the following equations:

a) $y = 2x + 1$

b) $y = 3x - 4$

c) $y = -2x + 3$

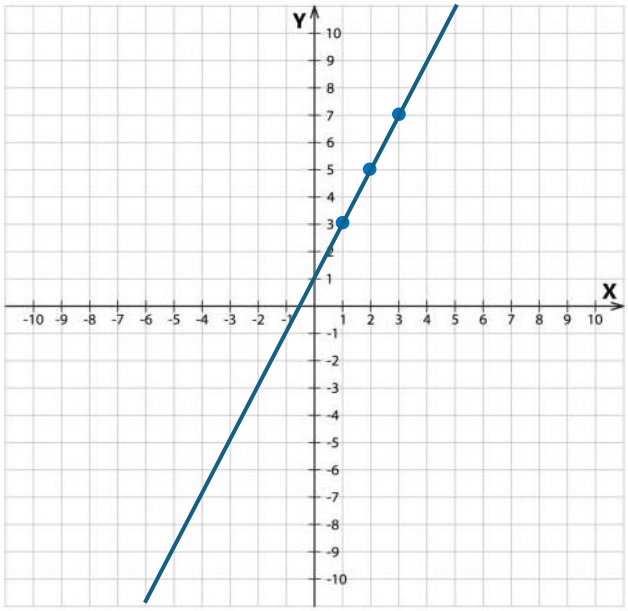
a) $y = 2x + 1$ means times x by 2 then add 1.

(**1**, 3) is on the line since **1** x 2 + 1 = 3

(**2**, 5) is on the line since **2** x 2 + 1 = 5

(**3**, 7) is on the line since **3** x 2 + 1 = 7

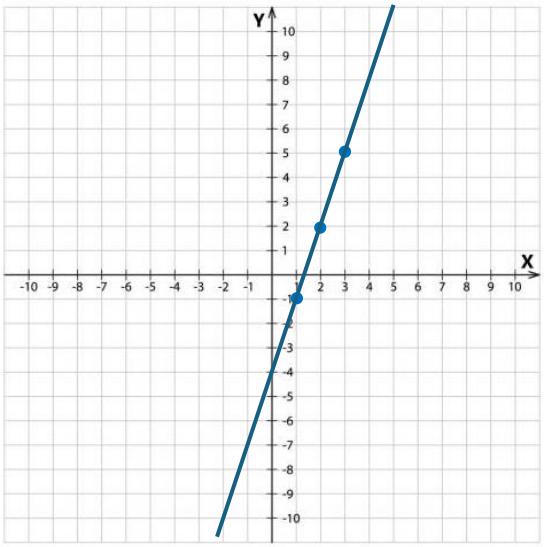
Plot these points and join with a straight line.



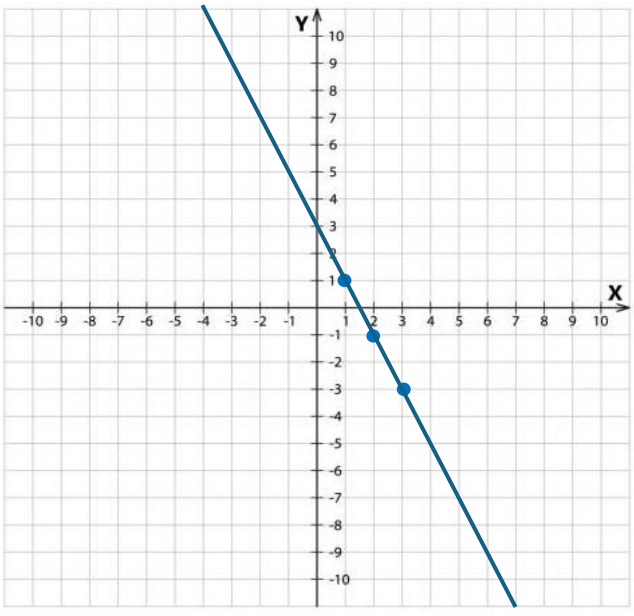
b) $y = 3x - 4$ means times x by 3 then take away 4.

(**1**, -1) is on the line since **1** x 3 – 4 = -1
(**2**, 2) is on the line since **2** x 3 – 4 = 2
(**3**, 5) is on the line since **3** x 3 – 4 = 5

Plot these points and join with a straight line.



c) $y = -2x + 3$ means times x by -2 and then add 3.

(**1**, 1) is on the line since **1** x -2 + 3 = 1
(**2**, -1) is on the line since **2** x -2 + 3 = -1
(**3**, -3) is on the line since **3** x -2 + 3 = -3

Plot the points and join with a straight line.